HDD / DVD Recorder Combi DVDR520H/00/02/05/37

Service
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Service Manual

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1. Specifications

SPECIFICATIONS

DISC TYPES SUPPORTED (Read Only):
DVD-R/RW, DVD+R/RW, CD-R/RW

CONTENT FORMAT SUPPORTED :
1) DVD-Video
2) DVD+VR (DVD+VR format is compatible with DVD-Video in most case)
3) Video CD
4) Super VCD
5) Audio CD
6) MP3
   Maximum number of files recognizable : 9999 files
   Compression rate : between 32 kbps and 320 kbps
7) JPEG
   Maximum number of pictures recognizable : 9999 files
8) BMP
   Maximum number of pictures recognizable : 9999 files

RECORDABLE MEDIA SUPPORTED:

1)	DVD+R	(DVD+VR Mode)
2)	DVD+RW	(DVD+VR Mode)
3)	Bulit-in 80GB HDD	(DVD+VR mode)

VIDEO RECORDING MODE

Mode	DVD	HDD
M1	1hr	17hr
M2	2hrs	34hr
M2x	2.5hrs	42hr
M3	3hrs	51hr
M4	4hrs	68hr
M6	6hrs	102hr

VIDEO RECORDING FORMAT
MPEG2: DVD+VR (M1/M2/M2x/M3/M4 mode)
MPEG1: DVD+VR (M6 mode)

VIDEO PERFORMANCE

DA Converter	10-bit / 54MHz
Composite Output	1 Vpp 75 Ohm
Components Output	Y : 1 Vpp 75 Ohm P_b: 0.7 Vpp 75 Ohm P_r: 0.7 Vpp 75 Ohm
SCART Output	CVBS/S-Video/RGB

AUDIO RECORDING FORMAT
DVD+VR (M1/M2/M2x/M3/M4/M6 mode): Dolby Digital 2-channel

AUDIO FORMAT SUPPORDED - Playback

Analog output	2channel
Digital output	coaxial/optical
Format supported	LPCM/Dolby Digital/MPEG

AUDIO PERFORMANCE

DA Converter	24-bit/96KHZ
AD Converter	24-bit/96KHZ
Signal-Noise (1kHz)	≥90dB
Dynamic Range (1kHz)	≥80dB
Cannel Separation (1kHz)	≥110dB
Total Harmonic Distortion (1kHz)	≤70dB

TUNER

TV format	PAL

CONNECTIONS
FRONT PANEL

Video Input	RCA Connector (yellow) x1
Audio L/R Input	RCA Connector (white/red) x1
IEEE 1394 Input	Mini jack x1

REAR PANEL

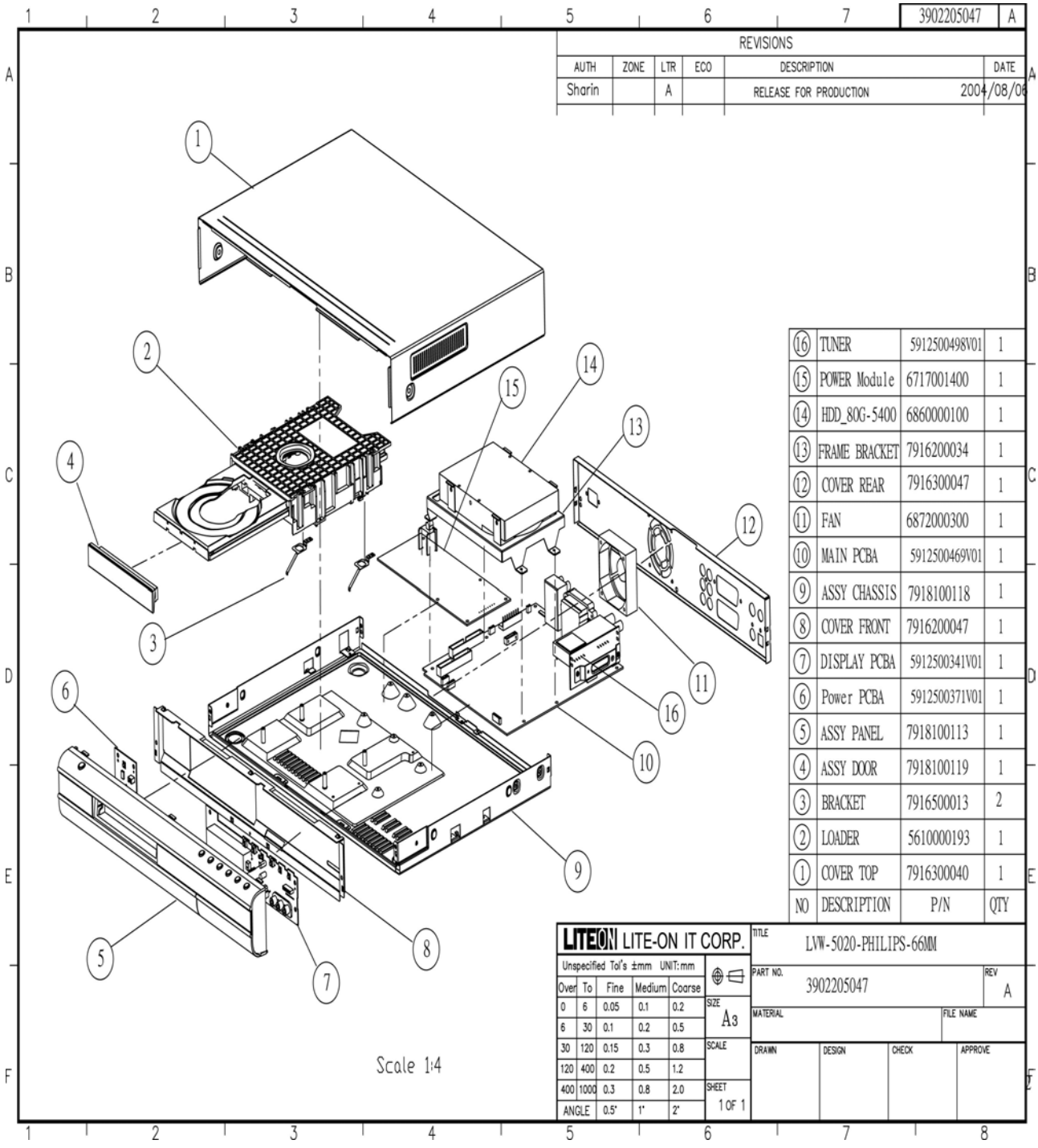
Video Output	RCA Connector (yellow) x1
Audio L/R Output	RCA Connector (white/red) x1
SCART Output	21 pin, CVBS/RGB/S-Video
SCART Input	21 pin, CVBS/RGB
Component / Progressive Scan Output	Y, P_b, P_r (Green/Blue/Red) x1
Digital Audio Output	Coaxial x1 Optical x1

GENERAL

Power Supply	AC 200 ~ 240V 50Hz
Power Consumption	Approx. 50 W
Operating Temperature	+5° C to +40° C (+36° F to +104° F)
Operating Humidity	5% to 80% RH
Dimensions(W/H/D):	430 x 66 x 316 mm
Net Weight:	Approx. 4.8 kg

Notes:
The specifications and design of this product are subject to change without notice.

2. Exploded View Drawing



NO	DESCRIPTION	P/N	QTY
16	TUNER	5912500498V01	1
15	POWER Module	6717001400	1
14	HDD_80G-5400	6860000100	1
13	FRAME BRACKET	7916200034	1
12	COVER REAR	7916300047	1
11	FAN	6872000300	1
10	MAIN PCBA	5912500469V01	1
9	ASSY CHASSIS	7918100118	1
8	COVER FRONT	7916200047	1
7	DISPLAY PCBA	5912500341V01	1
6	Power PCBA	5912500371V01	1
5	ASSY PANEL	7918100113	1
4	ASSY DOOR	7918100119	1
3	BRACKET	7916500013	2
2	LOADER	5610000193	1
1	COVER TOP	7916300040	1

LITEON LITE-ON IT CORP.

Unspecified Tol's ±mm UNIT:mm				
Over	To	Fine	Medium	Coarse
0	6	0.05	0.1	0.2
6	30	0.1	0.2	0.5
30	120	0.15	0.3	0.8
120	400	0.2	0.5	1.2
400	1000	0.3	0.8	2.0
ANGLE		0.5°	1°	2°

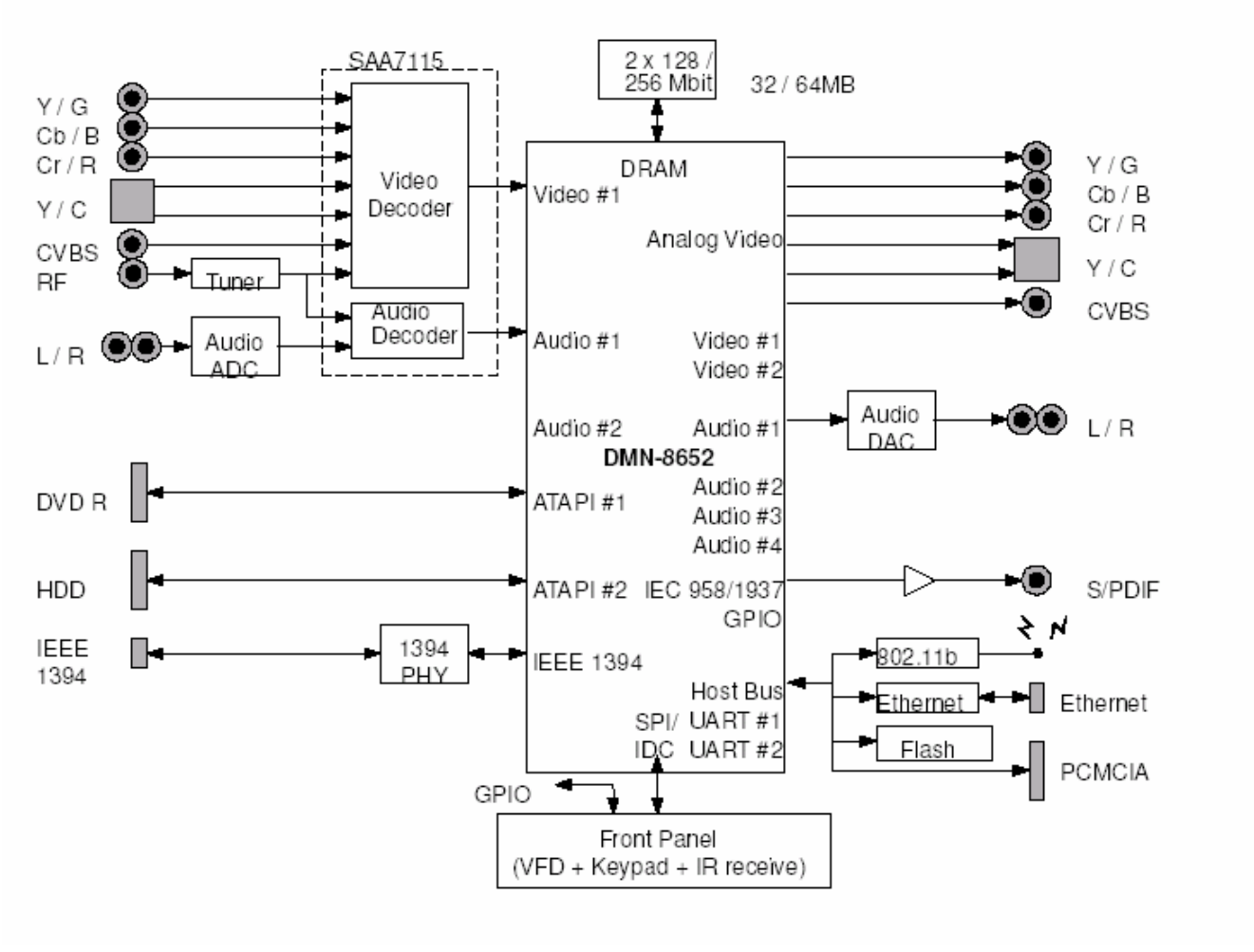
TITLE: LWW-5020-PHILIPS-66MM
PART NO.: 3902205047 REV: A
SIZE: A3 SCALE: SHEET: 1 OF 1
MATERIAL FILE NAME
DRAWN DESIGN CHECK APPROVE

3. Introduction

This document states engineering specifications of both hardware and firmware of DVDR520H.

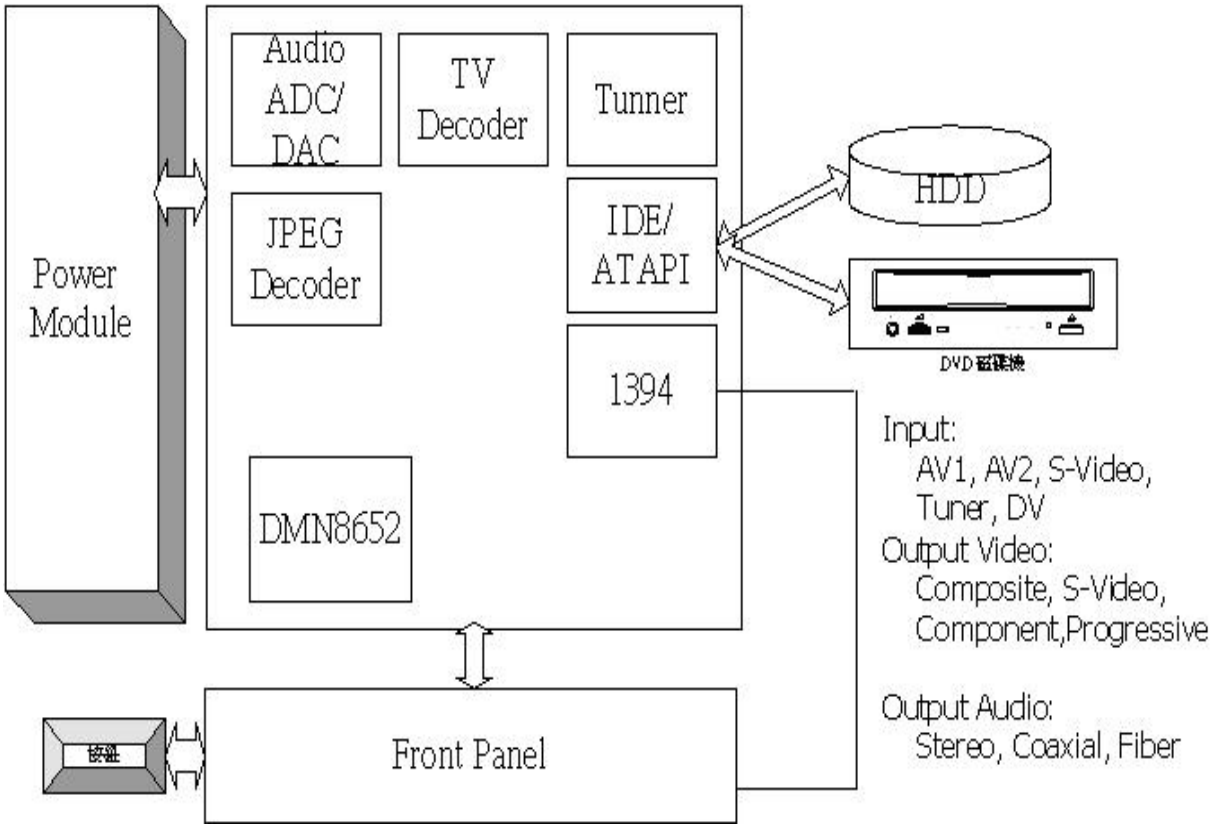
DVDR520H adapts LSI DMN8652 chip, DMN-8652 is a single chip dual drive (HDD/DVD) recorder processor. DMN-8602/DMN-8652 will be the evolutionary product family after DMN-8600 and DMN-8650. In this sense, DMN-8602/8652 will offer the same features as their predecessors, allow cost saving at the system level due to integration, and offer more features at the C-Ware level.

System Requirements



4. Product Validation Strategies and Process

4.1. System Block Diagram



4.1.1 Front Panel

There are six parts in the front panel of DVDR520H: (A) POWER, (B) AV Input 2 (C) DVD+/-RW Drive, (D) LED Display (E) IEE1394 (F) Command Buttons.

Part	Button/Display
(A)POWER	(A-1) POWER
(B)AV Input 2	(B-1) VIDEO IN, AUDIO IN (*)
(C)DVD+RW Drive	DDW-401s
(D)LED Display	(D-1) LED Displayer
(E)IEEE1394	(E-1) IEEE1394 4-pin mini connector
(F)Comment Buttons	(F-1) ~ (F-6) are to be defined

- AV Input 2: For easy access, standard red (right channel), white (left channel), and yellow (video) CVBS (RCA) audio/video jacks are located on the front panel of the DVDR520H. To connect a camcorder or other audio/video source, simply connect the unit's RCA input jacks to the corresponding output jacks on the other side.

4.1.2 Rear Panel

AV Input 1

The rear panel of the DVDR520H features standard red (right channel), white (left channel), and yellow (video) CVBS (RCA) audio/video jacks, such as those are commonly found in VCRs, record players, and a wide variety of other audio/video sources.

AV Input 1 for S-VIDEO IN

The rear panel AV Input 1 of the DVDR520H features an S-Video connector, which allows a higher-quality connection to a camcorder, television, or other video source. When recording from the S-Video source, the audio input will be sourced from the red (right channel) and white (left channel) audio jacks (labeled "R" and "L", respectively) on the rear panel.

AV Output

The rear panel of the DVDR520H features standard red (right channel), white (left channel), and yellow (video) CVBS (RCA) audio/video jacks, such as are commonly found in VCRs, players, and a wide variety of other audio/video sources.

AV Output for S-VIDEO

The rear panel AV Output of the DVDR520H features an S-Video connector, which allows a higher-quality connection to a camcorder, television, or other display device.

AV Output for Component Colors: YCbCr

The rear panel AV Output of the DVDR520H also features a component colors (YCbCr) output, which allows a higher-quality connection to a camcorder, television, or other display device.

2CH Audio Output

The rear panel of the DVDR520H features a set of 2CH audio connectors, which allows a high-quality audio output.

Digital Audio Output

The rear panel of the DVDR520H features a coaxial connector and an optical connector, which allows a high-quality audio output.

Tuner

The rear panel of the DVDR520H features a set of Tuner, which allows recording broadcast programs with stereo audio at following areas: NTSC – USA/Taiwan, PAL: B/G/D/K/I. Besides the cable TV signal input, a loop-through connector is also provided.

4.2 Main Board

- Main processor and MPEG CODEC : DMN-8652
- RAM : 256MB DDR
- FLASH : 4MB
- TV Encoder : NTSC/PAL Composite, S-Video or Component
- TV Decoder : NTSC/PAL Composite or S-Video
- Audio Input : Stereo
- Audio Output : Stereo
- Tuner : NTSC or PAL, monotone
- IEEE 1394 PHY : IEEE1394a, 100/200/400Mbps
- IDE : 1. Port
- Front panel I/O : 1. IR interface
  2. LED display module
  3. Scheduled boot-up
  4. Repeat key scan (up to 5 times per second)
  5. System power on/off control
  6. Extended I/O

4.3 Front Panel

- LED display module : 8 numeric characters
- Key : 6
- RCA jack : 1
- Mini IEEE-1394 jack : 1
- IR receiver : 1

4.4 Power PCB

- Key : 1

4.5 Power module

- Input: 100V ~ 240V, 50/60Hz
- Output: 12V / 5V / 3.3V / AUX_5V
- Capacity: ~50W

5. Test tool introduction

There will be a testing DVD disc (for NTSC system named as **5-1** disc, for PAL system named as **5-2P** disc) as a tool when repair, below will introduce the content of the disc

5.1 Performance Testing Procedure mainly contains 6 parts:

1). Video Signal Test

2). Speaker & Sound Signal Test

3). Music Demo

4). Video Demo

5). Karaoke Demo

6). Digital Signal Test (not usable for the time being)

5.2 Test Instructions:

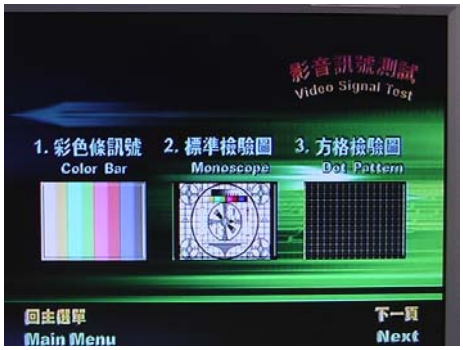
1). Video Signal Test need go through 6 screen pictures to check the output

Note of Step:

Login the picture as below for no. 1--Video Signal Test

Then, 3 pictures will show up on the screen: 1.Color bar, 2.Mono scope and 3.Dot Pattern.

And test will automatically go on to playback the 3 pictures shown as below:



- **Test Criteria:**

  Color bar has sharp, bright and stable color show;

  Mono scope or Dot pattern has no tilt or twisted effect;

  The RGB picture as below has normally good effect to the naked eyes.

If anything undeterminable, please refer to the following factors to evaluate:

Video Performance (The test appliance is Tektronix VM 700/s-video VM500/Component):

DA Converter	10-bit/54 MHZ
Composite Output	1Vpp &5 Ohm
S-video Output	Y: 1Vpp 75Ohm C: 0.3Vpp 75 Ohm
Component Output	Y: 1Vpp 75Ohm Pb: 0.7 Vpp 75 Ohm Pr: 0.7 Vpp 75 Ohm

2). Speaker & Sound Signal Test is to test its output audio fineness and locating efficiency of the speaker.

Note of Step:

Select no.2 --- Speaker & Sound Signal Test in the login. The test will check the locating efficiency and audio signal as well as special frequency.

- **Test Criteria:**

  The standard audio output is clear without popping and the signal output from Hi-Fi is normal.

  If anything undeterminable, please refer to the following factors to evaluate:

  Audio Performance (The test appliance is Audio position SWR-2122U)

DA converter	24 –bit /192KHZ
AD converter	≦24-bit
Signal-Noise (1kHZ)	≧90dB
Dynamic range(1kHZ)	≧80dB
Cannel Separation(1kHZ)	≧80dB
Total Harmonic Distortion(1kHZ)	≦-65dB

3). Music Demo test is to check the video output signal good without noise.

4). Video Demo test is to check the normal function of subtitle, language, angle and so on.

Login in the main test menu for no.4 Video Demo and press the key of “Navi” on remote to choose “Subtitle” “Audio” and “Angle” to check the normal function.

5). Karaoke Demo Test:

5.3 Items of the DVD disc in common use when rma

5.3.1 Necessary Repairing tools in need to test the following 3 items:

A. Video output

B. Audio output

C. AV output (film)

5.3.2 Note of step:

STEP1:

A. Insert the DVD VIDEO **5-1** / **5-2P** disc and it will auto playback

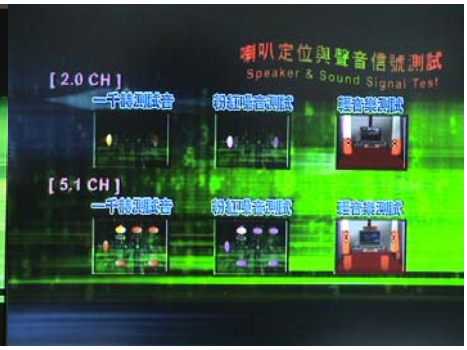
B.Press the key of "Top Menu" on remote to login the menu

C.Select the item 1—Video Signal Test and press "Enter" to start the test on any color difference in Color bar and the standard fineness of the R G B, then press

"Top Menu" back to test menu

STEP2:

A.Select item 2—Speaker & Sound Signal Test and press "Enter" for the item 1--Speaker & Sound Signal Test, then press "Enter" for "2.0CH" and the "1KHZ Audio Test", to test the R/L- C's output is normally good or not. And then press "Top Menu" back to menu



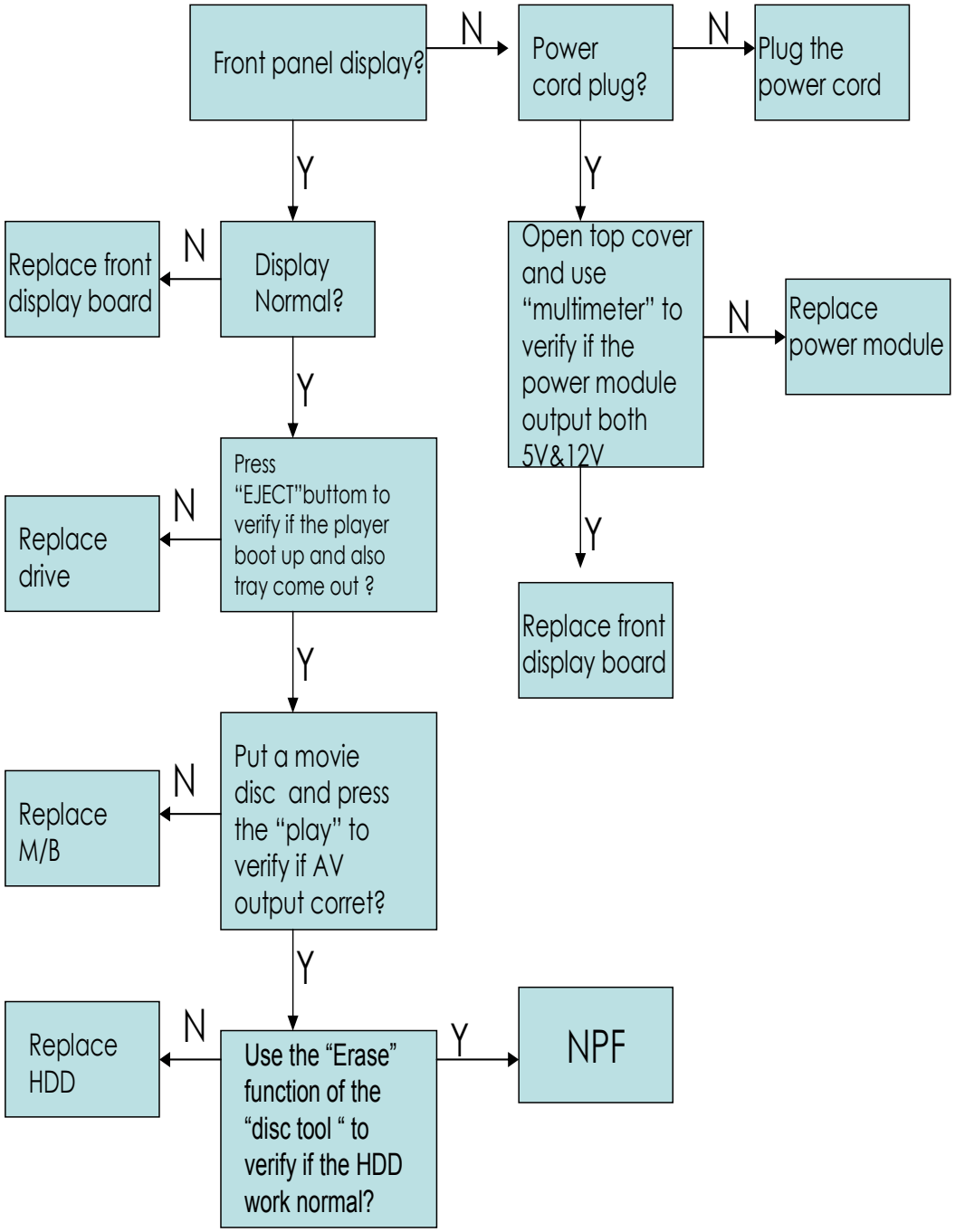
B.In the menu to choose item 4--Video Demo and press "Enter" to start the test, to check the normally good video and audio output , then press "Top Menu" back to test menu.

STEP3:

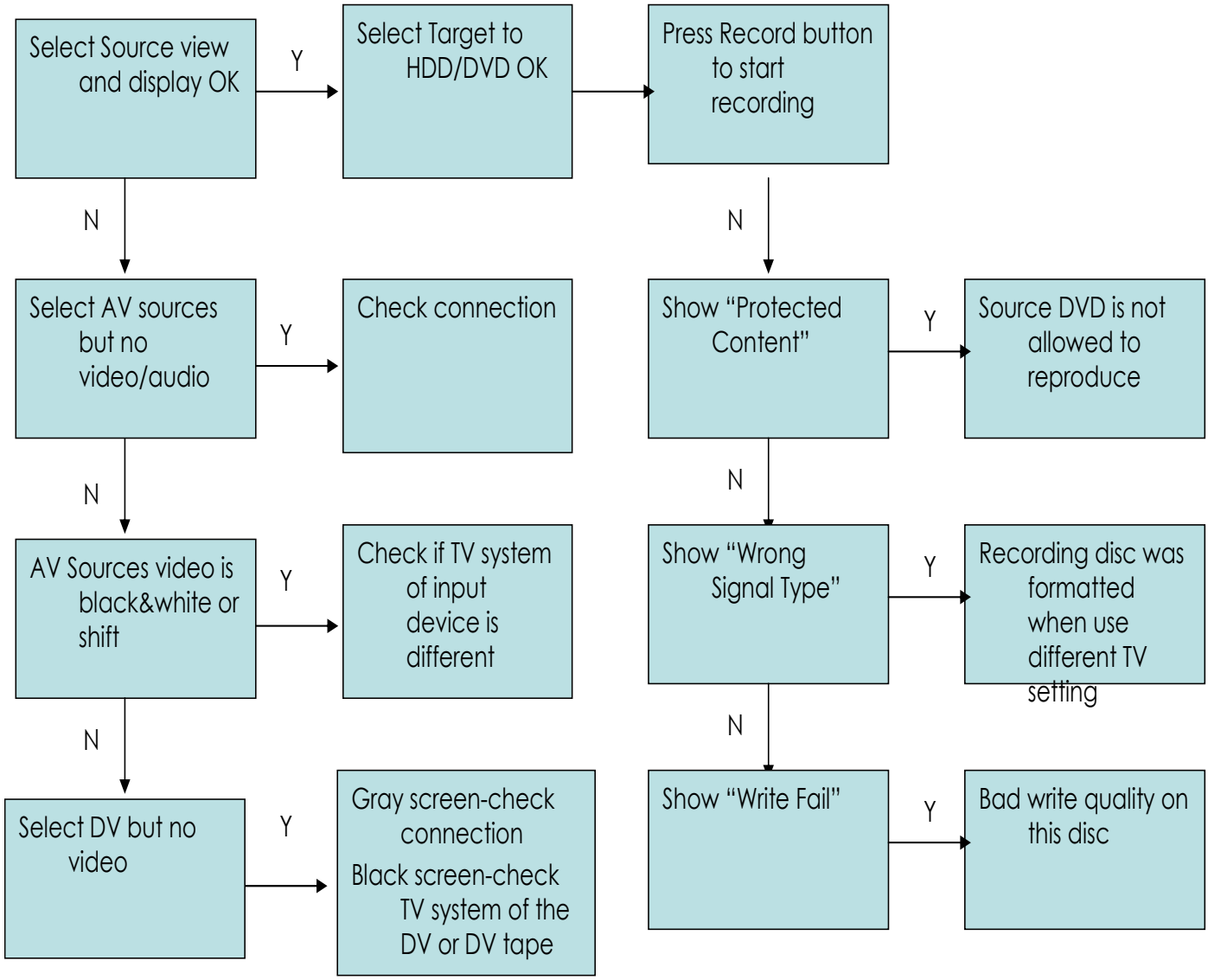
Take out the test disc and the test is over.

6. Fault Finding Tree

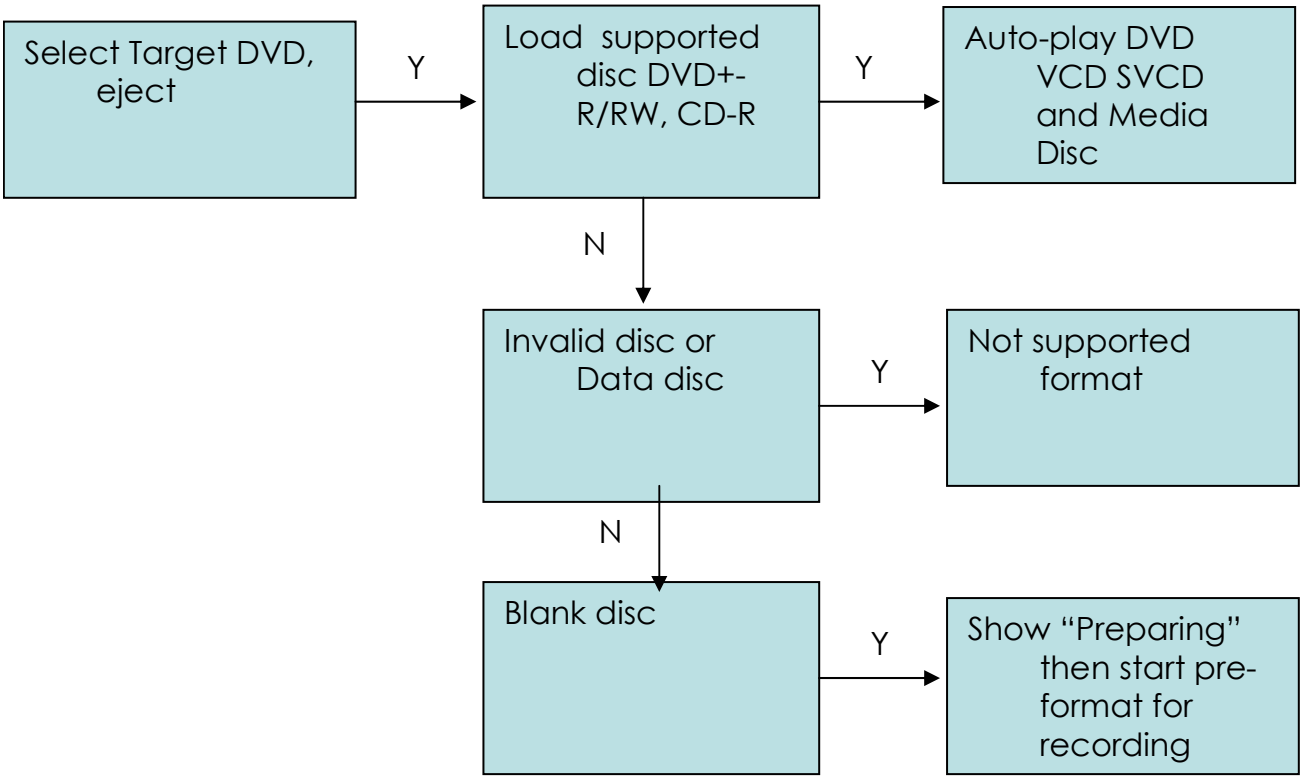
Before repair please make good connection with all input and output device



Recording


Select Source view and display OK
Y
Select Target to HDD/DVD OK
Press Record button to start recording
N
N
Select AV sources but no video/audio
Y
Check connection
Show "Protected Content"
Y
Source DVD is not allowed to reproduce
N
N
AV Sources video is black&white or shift
Y
Check if TV system of input device is different
Show "Wrong Signal Type"
Y
Recording disc was formatted when use different TV setting
N
N
Select DV but no video
Y
Gray screen-check connection
Black screen-check TV system of the DV or DV tape
Show "Write Fail"
Y
Bad write quality on this disc

DVD Playback



Reference of defect symptoms for repair

- After power cord plug in ,LED no display , but AV output normal after power on -> replace display board
- After power on , the color of the screen isn't correct -> replace M/B
- After power on , the fan doesn't work -> replace power module / Fan
- Can't eject or show "No Disc" -> replace drive
- Can't auto format any brand new disc -> replace drive
- Recording will auto stop or hang -> replace M/B & drive
- Playback will have mosaic -> replace M/B
- Can't format HDD -> replace HDD
- Can't record with HDD -> replace HDD
- No Audio or audio output abnormal -> replace M/B
- Optical / Coaxial no output when the setting is set as DTS output -> replace M/B
- Can't update F/W through drive -> replace drive
- Can't detect DV when plug in/out with a DV -> replace display board
- AV1 input mode doesn't output video / audio when connected to a normal external AV source -> replace display board
- AV2 (Scart) / S-Video input mode doesn't output video / audio when connected to a normal external AV source -> replace M/B

Module Fail / Problem	Remedy / Symptom
HDD	■ Run Disc Tool/Format/HDD show "Fail", this could be a bad HDD
	■ Run Disc Tool/Defragment show "Fail", this could be a bad HDD
	■ Format no problem but show "Write Fail" during recording , this could be a bad HDD
DVD Drive	■ Load any disc always show "No disc", this could be a bad DVD drive
	■ Load some kind of discs always show "No disc". For example load DVD no problem, but load CD-R show "No disc", this could be a bad DVD drive
	■ Cannot open tray. User can try to power off the recorder, and then press "Eject" to boot again. If still can not open, this could be a bad DVD drive. If tray open successfully and there is a disc inside, it's the disc cause drive busy. Try another disc, if user can tray in/out no problem, the drive should be ok.
DVD/CD disc	■ Run Disc Tool/Format/DVD show "Fail". This could be a bad disc or not compatible with our DVD drive.
	■ Format no problem but show "Write Fail" then stop during recording. Press "Record" again may be user can continue record, but part of the audio/video on this disc may not smooth. This could be a bad disc or not compatible with our DVD drive.
	■ Take long time to load disc then show “Invalid Disc". The disc could be a bad disc or unsupported format
Power	■ Connect power cord, but LED display show nothing, Press remote or button on the panel still nothing happened. This could be a power board problem
	■ Replace power cord if find any available. We use a common power cord user may able to find the same one on his other electronic products
Remote	■ Press buttons on remote but nothing happened, system can still power on by buttons on panel. OSD doesn't show system receive any key. This could be a bad remote or ran out of battery.
	■ Or it could be a bad receiver on the front panel
Front Panel	■ System can power on and work by remote no problem, but press buttons on panel does not work. This could be a bad front panel

Module Fail / Problem	Remedy / Symptom
Video Output	■ Can not see any display or color abnormal, video distortion. Make sure cables connected correctly. Try another output like S-video, AV, Component, and Scart.
	■ Run SETUP to select available video output
Audio Output	■ Can not hear any sound output through speakers of TV or amplifier. Make sure cables connected correctly. Try another output like AV, optical, coaxial
	■ Playing DVD movie, when select DTS out on DVD audio menu no audio output. User needs to run SETUP/Audio/DTS to set DTS ON
TV Tuner	■ Run SETUP, Tuner setting correctly, but after scan TV channel can not select correct TV programs. Run SETUP/ Tuner/TV signal, select Antenna or Cable then run "Channel Scan" again, don't use "Auto". "Auto" will re-arrange channel table and remove channel numbers not available.
	■ User selects TV signal/country correctly, after scan still cannot select channel, this could be a bad TV tuner.
External source	■ Connect external source like AV, S-video, Scart, DV-link (1394) can not see the video input. Make sure cables connected correctly. If these signals connect to other AV products no problem. This could be a bad connector
	■ For DV, user need to know the DV is NTSC/PAL, and the playing DV tape is NTSC/PAL. They must be the same TV type as the recorder to make it works properly.
Can not Real-time Record	■ Show "Protected Content", it's Copy-Protected and not allowed to copy
	■ Show "Wrong Signal Type" when record to disc. The disc was formatted by different TV system (NTSC/PAL). For DVD±RW, user can reformat this disc (contents on this disc will be erased). For DVD±R, user can only change another disc
	■ Press "Record" shows key blocked, will not start recording. Maybe user select wrong Target device. Press Target to choose HDD/DVD
	■ Empty DVD-R/RW, CD-R/RW user needs to format by Disc Tool before recording
Can not Timer Record	■ Open "Timer" record again, there is a message shows why it failed, please move the cursor to column status and it will show the reason it fails
	■ Selected recording "Target" is unable to record when Timer starting time

Module Fail / Problem	Remedy / Symptom
Cannot play a disc	■ If it's not "Invalid disc", could be unsupported format/contents in the disc
Copying	■ Show "Fail" when copying files/discs, it could be unsupported format
	■ Show "Fail" when copying recorded DVD+VR title, it could be out of disc space
System Upgrade	■ Follow the firmware update procedure in the chapter"Firmware update".
	■ If upgrade failed (power failure during upgrade or …), maybe every time system power on will show "Put Cd In". Users most load the upgrade disc again to recover.

7. Disassembly introduction

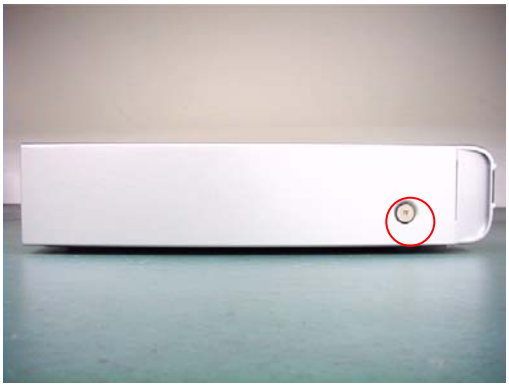
7.1 Disassemble the TOP-COVER:

Step 1:

Loosening the fixed screws of the TOP-COVER totally 6 screws, 4 on the rear panel and 1 on the left side and the other on the right side of the TOP-COVER, (as PICTURE 1 & 2 & 3)

(PICTURE 1)

(PICTURE 2)



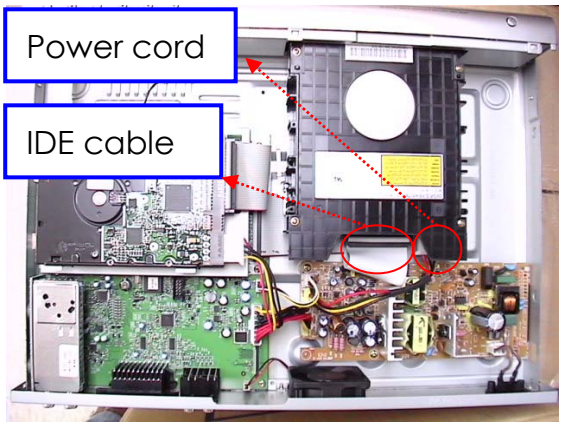
(PICTURE 3)

Step 2:

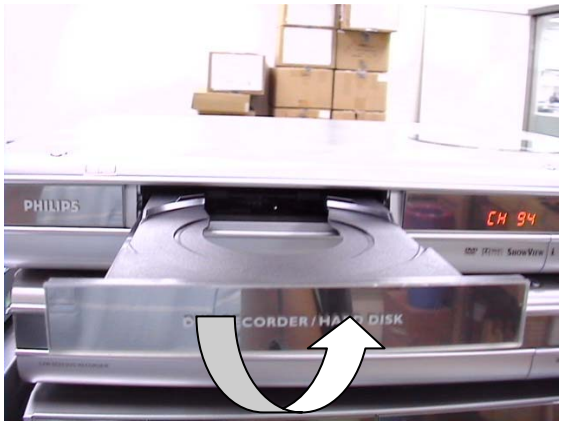
Pull back to remove the TOP-COVER and let the cover-top lie on horizontally smooth desk to prevent being out-of-shape place upside down (as PICTURE 4)

(PICTURE 4)

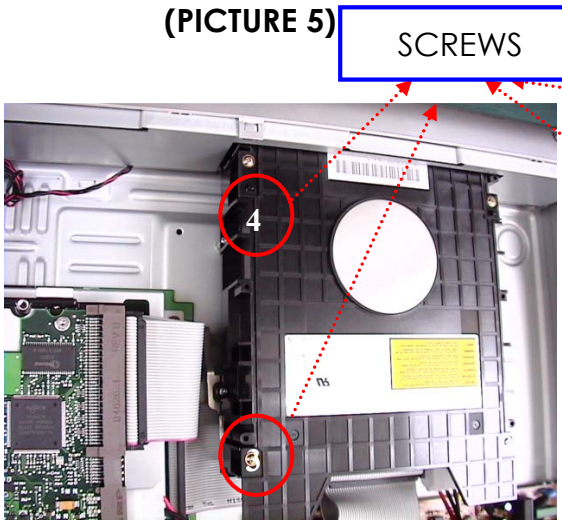
7.2 Disassemble the Drive:



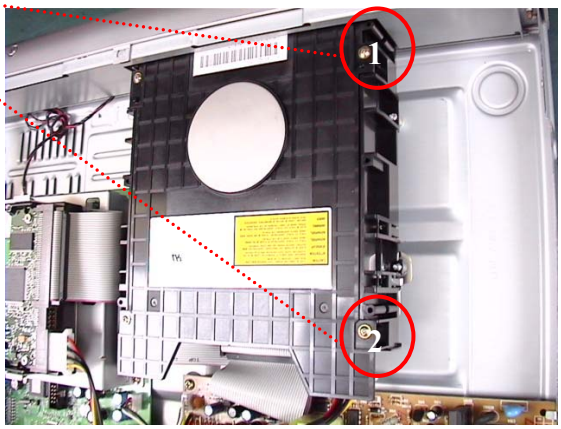
(PICTURE 5)



(PICTURE 6)



(PICTURE 7)



(PICTURE 8)

Step 1: Tray out → pull out the door and lift up to disassemble the tray door (as PICTURE 6)

Step 2: Tray in → Power off → unplug the power cord

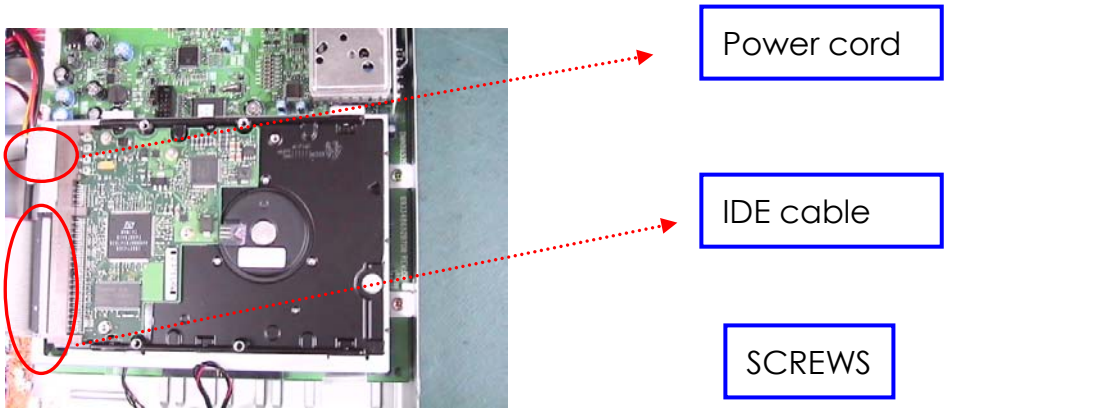
Step 3: Disassembly the top cover

Step 4: Unplug the power cord and IDE cable (as PICTURE 5)

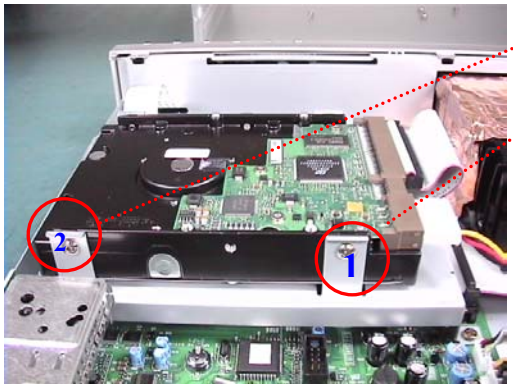
Step 5: Remove the four fixed screws of the drive (screw 1~4 as PICTURE 7 &8)

Step 6: Remove the Drive

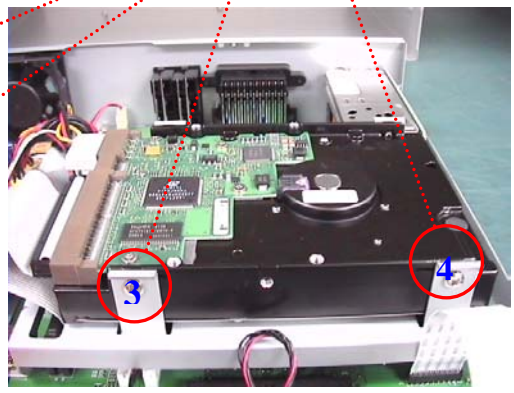
7.3 Disassemble HDD:



(PICTURE 9)



(PICTURE 10)



(PICTURE 11)

(PICTURE 12)

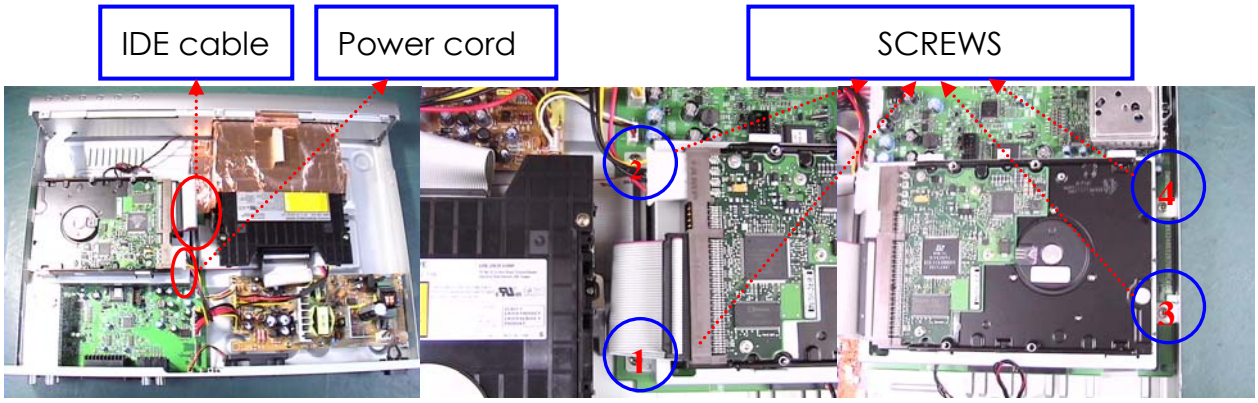
Step 1: Disassembly the top cover

Step 2: Unplug the power cord and IDE cable (as **PICTURE 9**)

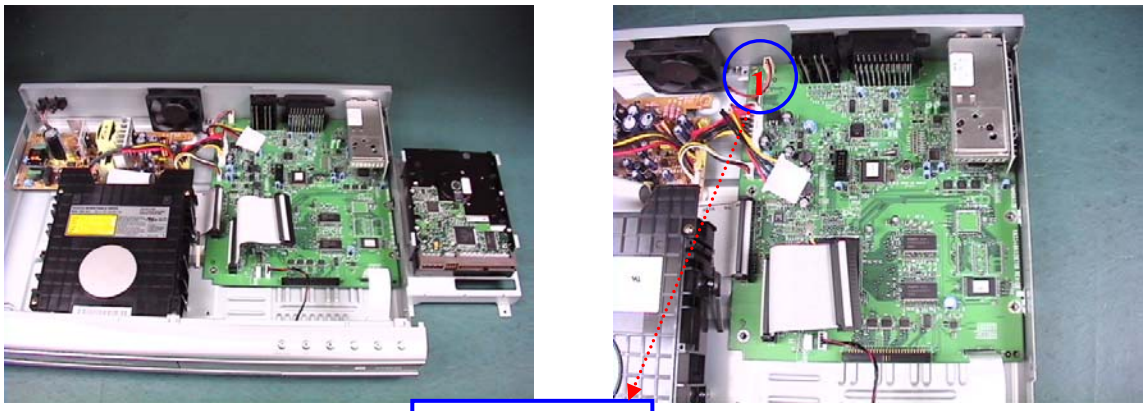
Step 3: Loosen the screws off the chassis (1~4 in **PICTURE 10 & 11**)

Step 4: Take out the HDD (as **PICTURE 12**)

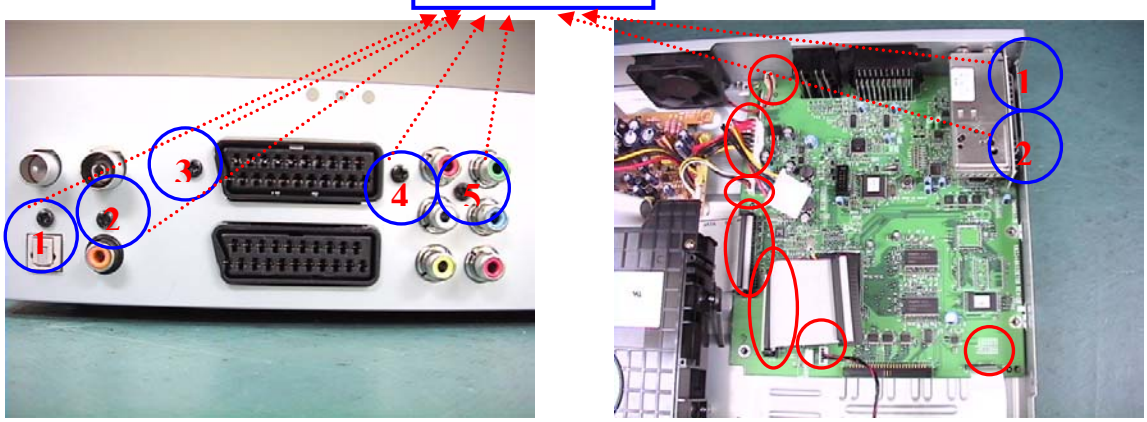
7.4 Disassemble the M/B:



(PICTURE 13) **(PICTURE 14)** **(PICTURE 15)**



(PICTURE 16) **(PICTURE 17)**



(PICTURE 18) **(PICTURE 19)**

Step 1: Unplug the power cord and IDE cable of the HDD module (as PICTURE 13)

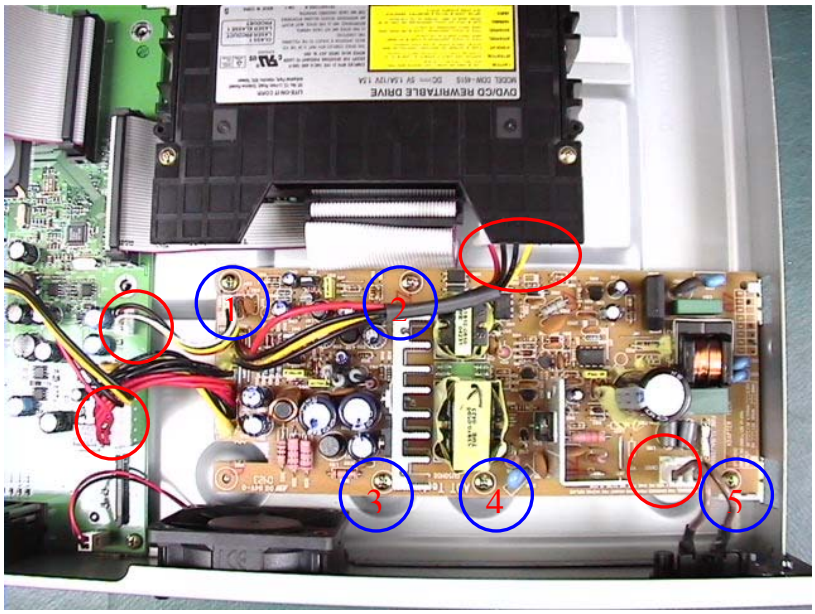
Step 2: Remove the HDD module from the M/B first, unfix the 4 screws of the HDD module (as PICTURE14, 15, 16)

Step 3: Unfixed the screw of the M/B and remove all the cable (7 cables) connected to M/B (as PICTURE 17 & 19)

Step 4: Loosen the 5 screws off the rear panel (as PICTURE 18**)**

Note: Tuner can be removed and reused if isn't broken when M/B is disassembled

7.5 Disassemble the Power Module



(PICTURE 20)

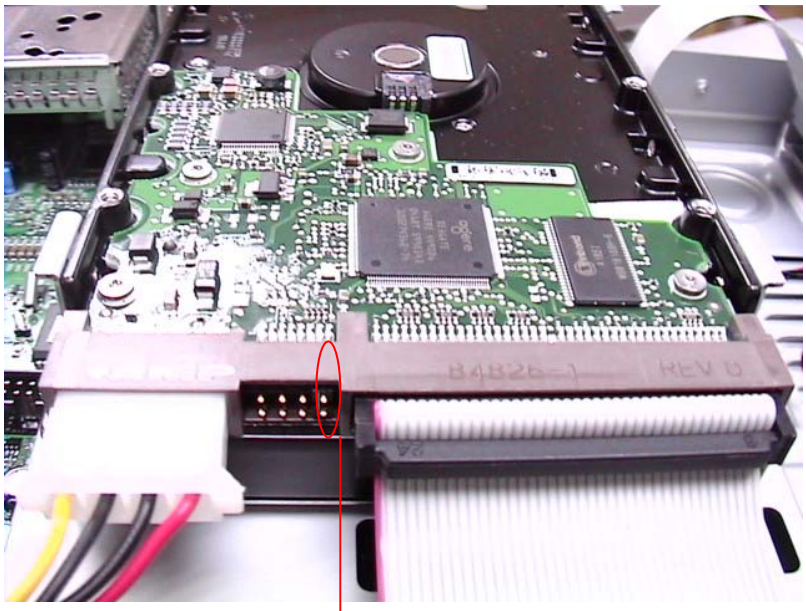
Step 1: Disconnect all the cables connected to other module (total 4 cables as red circle in PICTURE 20)

Step 2: Loosen the screws off the chassis (1~5 in PICTURE 20)

Step 3: Take out the power module

7.6 JUMP of HDD & ODD

HDD



JUMP

ODD

JUMP

8. Firmware Update

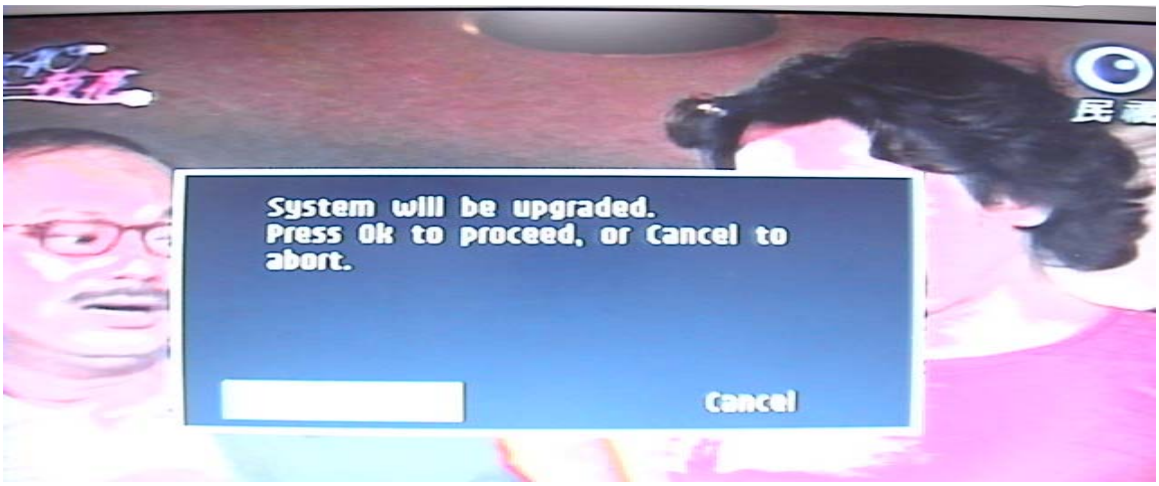
1. Burn the firmware on a single-session ISO disc.
2. Power on the system.

3. After system is ready, load the firmware update disc.

4. System will start detect the firmware image and if the image is detected, LED will show "F-UP xxxx", where "xxxx" is the build number.

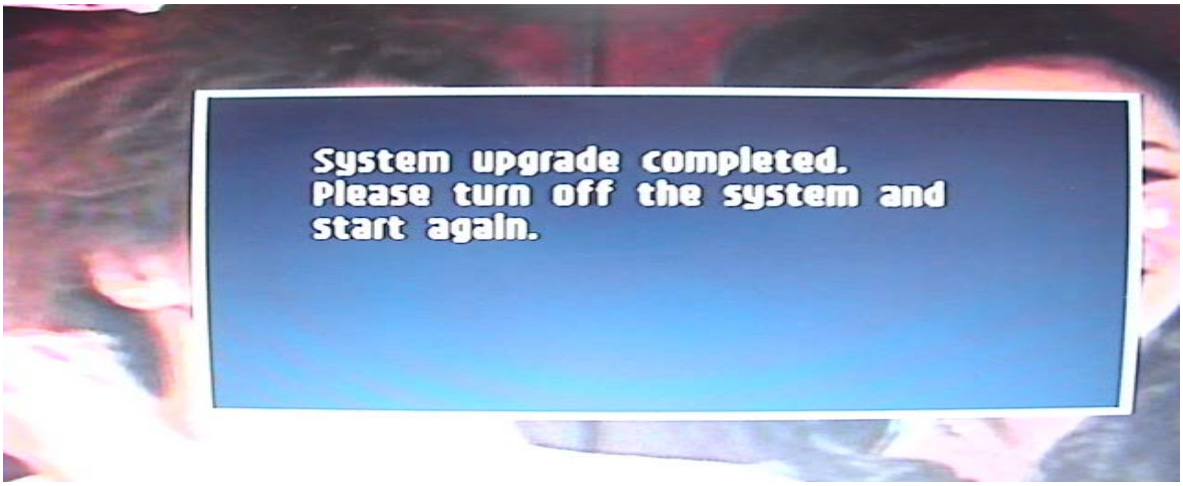
5. If system detects the image file, a confirm dialog will display on the screen.

Follow the instruction to complete the update process.



6. If system firmware is updated without error, LED will show "done". Else "error" will show.

7. Reboot the system.



SERVICE TOOLS

	9965 000 26088	Test Disc 5-2P for PAL system	/00/02/05
	9965 000 26216	Test Disc 5-1 for NTSC system	/37

SERVICE SPARE PARTS

2	9965 000 26091	DVDR MECHANISM MODULE	
5+6+7	9965 000 26092	FRONT PANEL + PCBA ASSEMBLY	
10	9965 000 26093	MAIN BOARD WITHOUT TUNER	
11	9965 000 26094	FAN	
14	9965 000 26095	HD DRIVE HDD_80G_5400	
15	9965 000 26096	POWER BOARD	
16	9965 000 26090	TUNER UNIT PAL	/00/02/05
16	9965 000 26220	TUNER UNIT NTSC	/37
	9965 000 26089	REMOTE CONTROL UNIT	

Note: Only the parts mentioned in this list are normal service spare parts.

REVISION LIST

Version 1.0

* Original Release

Version 1.1

* Correction of page 21 - Missing diassembly instruction 7.1